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**Escargot restricts niche cell to stem cell conversion in the Drosophila testis.**

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**Public Summary:**

**Scientific Abstract:**

Stem cells reside within specialized microenvironments, or niches, that control many aspects of stem cell behavior. Somatic hub cells in the Drosophila testis regulate the behavior of cyst stem cells (CySCs) and germline stem cells (GSCs) and are a primary component of the testis stem cell niche. The shutoff (shof) mutation, characterized by premature loss of GSCs and CySCs, was mapped to a locus encoding the evolutionarily conserved transcription factor Escargot (Esg). Hub cells depleted of Esg acquire CySC characteristics and differentiate as cyst cells, resulting in complete loss of hub cells and eventually CySCs and GSCs, similar to the shof mutant phenotype. We identified Esg-interacting proteins and demonstrate an interaction between Esg and the corepressor C-terminal binding protein (CtBP), which was also required for maintenance of hub cell fate. Our results indicate that niche cells can acquire stem cell properties upon removal of a single transcription factor in vivo.

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